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10ME73

**Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**Hydraulics and Pneumatics**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting at least TWO full questions from each part.**

**PART – A**

- 1 a. What are the advantages and limitations of a hydraulic system? (06 Marks)  
b. Explain the working of axial piston pump with a neat sketch. (08 Marks)  
c. A gear pump has 75mm outside diameter, 50mm inside diameter and 25mm width. If the volumetric efficiency is 90%, what is the corresponding actual flow rate? The pump speed is 1000rpm. (06 Marks)
- 2 a. Explain with a neat sketch the working of a single acting cylinder. (06 Marks)  
b. With a neat sketch, explain first class lever system used with hydraulic cylinders to drive load. (08 Marks)  
c. A hydraulic motor has a displacement of 130cm<sup>3</sup> and operates with a pressure of 105 bar and speed of 2000rpm. If the actual flow rate consumed by the motor is 0.005 m<sup>3</sup>/s and the actual torque delivered by the motor is 200 N-m find i)  $\eta_v$  ii)  $\eta_m$  iii)  $\eta_o$ . (06 Marks)
- 3 a. Explain the working of shuffle valve with a sketch. (06 Marks)  
b. Explain the operation of sequence valve with a neat sketch. (08 Marks)  
c. Give the symbol for the following:  
Pilot operated check valve, pressure sequence valve, pressure reducing valve, variable flow control valve four way three position with float neutral, four way three position with regenerative neutral? (06 Marks)
- 4 a. Explain the control of double acting cylinder with a sketch. (06 Marks)  
b. Explain hydraulic cylinder sequencing circuit with a sketch. (08 Marks)  
c. Explain the difference between meter-in and meter-out circuit with a sketch. (06 Marks)

**PART – B**

- 5 a. Explain any six service properties of hydraulic fluids. (06 Marks)  
b. Explain the reservoir system with a neat sketch. (08 Marks)  
c. Explain the general types of hydraulic fluids. (06 Marks)
- 6 a. Give the classification of air cylinders. (06 Marks)  
b. Explain the structure of pneumatic control system with a neat sketch. (08 Marks)  
c. Explain the rodless cylinder with a neat sketch. (06 Marks)
- 7 a. Explain the sliding spool type of DCV with a sketch. (06 Marks)  
b. Explain with a suitable circuit diagram application of the memory valve. (06 Marks)  
c. With a neat sketch, explain how following functions are generated in pneumatic system  
i) AND function ii) OR function. (08 Marks)
- 8 a. Explain displacement step diagram for stamping operation. (06 Marks)  
b. Explain use of relay with a sketch. (06 Marks)  
c. Explain air filter for pneumatic system with a neat sketch. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.